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General Accounting Office

Federal Rental Housing Production Incentives: Effect On Rents And Investor Returns

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Over the years, the federal government has used tax incentives, mortgage insurance, and direct financing subsidies to encourage the production of rental housing and to assist lower income families in obtaining affordable housing. This report presents information on the relationship between lower income families' rents and investors' after-tax rates of return for these production incentives.

Each production incentive can either increase investor profitability and/or lower rents. However, the extent that rates of return increase or rents decrease depends largely on the rate of return required to induce production, the availability of production incentives to investors, the competitive nature of individual rental housing markets, and the degree of rent control the federal government exercises.

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AND ECONOMIC DEVELOPMENT
DIVISION

B-218499

The Honorable Henry B. Gonzalez
Chairman, Subcommittee on Housing
and Community Development
Committee on Banking, Finance
and Urban Affairs
House of Representatives

Dear Mr. Chairman:

On March 18, 1985, in response to an earlier request, we briefed your office on our review of incentives used to encourage private investment in the production of multifamily rental housing. At the time of our briefing, we were requested to provide you with this report. The information contained in this report, which is in the form of a briefing document, is based on a discounted cash flow model which measures how various production incentives affect lower income families' rent and investors' after-tax rates of return.

Over the years, federal rental housing policy has developed primarily around stimulating production and assisting lower income families to afford decent, safe, and sanitary housing. For the most part, the federal government has encouraged private development of rental housing by providing (1) tax incentives that enable investors to recover development costs quickly and, in the process, shelter some of their income from federal taxes, (2) federal mortgage insurance that enables investors to leverage their financing (borrow a greater portion of development costs and invest less equity), and (3) direct financing subsidies to reduce mortgage financing costs. These incentives, together with rental assistance to supplement tenant rents, have been aimed at making multifamily rental housing more affordable to lower income families.

For each production incentive, the model measures the after-tax rate of return, given a rent level, or measures the rent level, given an assumed after-tax rate of return. The model

assumes a monthly market rent level of $470 needed to earn investors an after-tax rate of return of 15 percent over a 15-year holding period using a 6-percent inflation rate for a unit with a development cost of $32,000. Adequate data were not readily available to determine whether investors actually earn the 15 percent rate of return used in the model. However, the model produced similar rent and return relationships using the market rents needed to earn after-tax rates of return of 12 and 18 percent.

The model results showed that rental housing production incentives can either increase investor profitability and/or lower rents, thereby making rents more affordable by lower income families. For example, at the market rent level assumed in our study the tax incentives provided by the Economic Recovery Tax Act of '981 (ERTA), compared to the pre-ERTA tax incentives, increase investor rates of return from about 12.5 percent to 15 percent for conventional rental housing and to about 16 percent for low-income rental housing. The major change brought about by ERTA was to reduce the depreciation recovery period from about 33 years to 15 years for both conventional and low-income rental housing. ERTA's tax benefits, however, were modified by the Deficit Reduction Act of 1984, which increased the depreciation recovery period for conventional projects from 15 years to 18 years. The model results do not reflect this change. In a separate comparison, however, we estimated that the change to a 18-year depreciation recovery period would only slighly reduce investor rates of return for conventional housing. The 1984 act had no direct impact on low-income housing.

At the assumed market rent level needed to earn investors in conventional housing an after-tax rate of return of 15 percent, the model showed the following incremental increases for each production incentive:

--ERTA's low-income tax treatment benefits increase the rate of return from 15 to 16 percent.

--Financial leverage benefits from federal mortgage insurance increase the rate of return from 16 percent to about 25 percent.

--Below-market interest rate benefits from direct financing subsidies further increase the rate of return from about 25 percent to 29 percent.

Economic theory suggests that, as rates of return increase, more private investment in new rental housing should occur. This increase in the supply of rental housing puts pressure on investors to compete away some of these increased rates of return by accepting lower rents until supply and demand are brought into

balance. This interaction in the marketplace normally takes several years to complete.

The model showed that if the increased return from the production incentives were competed away, to the extent that investors earn a 15-percent after-tax rate of return, then monthly rents and rental assistance would decline. For example, if ERTA's low-income tax benefits were competed away, then monthly rents would decline from $470 to $445. Similarly, competing away the financial leverage benefits from federal mortgage insurance, together with the low-income tax treatment, would reduce monthly rents from $470 to $320. Finally, below-market interest rate benefits from direct financing subsidies, when competed away with the tax and financial leverage benefits, would reduce monthly rents to $260. With monthly rents of $260, rental housing would be affordable by very low-income families, without the need for federal rental assistance. These lower rents may also be available to higher income families in assisted rental housing. However, we did not attempt to measure the relationship between subsidy costs and benefits by renter income group.

However, the extent to which rates of return increase or rents are reduced depends largely on the rate of return required to induce development of rental housing, the availability of production incentives to investors, the competitive nature of individual rental housing markets, and the degree of rent control the federal government exercises. Appendix I contains more details on the results derived from our model.

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The discounted cash flow model we used was developed by Dr. William B. Brueggeman, Corrigan Professor of Real Estate, Southern Methodist University. The model has been previously used in various government and non-government studies related to housing and tax incentives. The model incorporates salient features for each production incentive and includes assumptions for such things as development costs, syndication costs, and financing and operating expenses. Given an assumed after-tax rate of return, the model estimates the rent levels needed to cover these costs. Similarly, given an assumed market rate rent level, the model estimates the investor's after-tax rate of return. The model results, however, cannot be used to forecast changes in production activity largely because the risks and returns of alternatives to the investment in rental housing production were not considered. Appendix II contains more details on our model and the assumptions used.

The views of directly responsible officials were sought during our work and are incorporated in the report where appropriate.

We did not request the Departments of Housing and Urban Development and the Treasury to review and comment officially on a draft of this report.

As agreed with your office, we are sending copies of this report to other interested committees and to the Secretaries of Housing and Urban Development and the Treasury. Copies will also be made available to other interested parties.

Sincerely yours,

for J. Dexter Peach
Director

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ABBREVIATIONS

ERTA	Economic Recovery Tax Act of 1981
HUD	Department of Housing and Urban Development
GAO	General Accounting Office

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GLOSSARY

After-tax cash flow	The annual cash return to the investor after provisions for operating expenses, mortgage payments, and federal tax savings or payments resulting from the investment.
Before-tax cash flow	The annual cash flow derived by deducting operating and debt service expenses from gross revenues. Negative before-tax cash flow exists when expenses exceed revenues.
Capital gains tax rate	Tax rate applied to the gain from the sale or disposition of a capital asset.
Component depreciation	Method of separately depreciating the components of a structure (e.g., roof, elevators) over their individual useful lives. In contrast, one depreciation rate is applied to the entire structure under the composite method of depreciation.
Conventional rental housing	Includes all privately owned rental housing built and operated without the assistance of federal, state, or local housing subsidies directed toward lower income families.
Declining balance depreciation	Method that allows depreciation charges to be deducted at a higher rate, up to 200 percent, than the straight line rate. This method accelerates depreciation deductions in the early years of the asset's useful life.
Discounted cash flow	The net present value of projected cash flows over an investment's expected holding period.
Economic depreciation	The loss of property value by age, physical deterioration, or functional or economic obsolescence over the economic useful life of the property. The useful life for economic depreciation is generally greater than the useful life for tax purposes.

Equity	The owner's interest or value in real estate over and above the liens against it.
Equity investment	Money an investor initially puts down to purchase an investment exclusive of any loans or borrowed funds.
Excess depreciation	Accelerated depreciation claimed in excess of that allowable under the straight line method at the time of sale. Depending upon the type of property sold and the length of time it was held, a portion of the excess depreciation could be "recaptured" and taxed as ordinary income, rather than as a capital gain.
Financial leverage	Using borrowed funds in the development or purchase of a property to increase investors' return on their equity investment. A greater percentage of borrowed funds relative to development costs reduces equity investment and increases financial leverage.
Internal rate of return	The annual rate of return at which the discounted cash flows from a project's operation and sale is equal to the initial equity investment.
Lower income family	A family whose income does not exceed 80 percent of the median income for the local area.
Low-income family	A family whose income is between 51 percent and 80 percent of the median income for the local area.
Low-income rental housing	Includes all privately owned rental housing built and/or operated with the assistance of federal, state, or local housing subsidies directed toward lower income families.
Marginal tax rate	The tax rate on the last dollar earned by the investor.

Residual value	The asset's market value (sales price) at the end of its remaining useful life or holding period.
Straight line depreciation	Method that allows depreciation charges to be deducted in equal amounts over the asset's useful life.
Sum-of-the-years digit depreciation	Method that allows depreciation charges to be deducted based on the sum of the number of years in the asset's useful life. This method accelerates depreciation in the early years of the asset's useful life.
Syndication	Sale of equity interest in housing projects to investors other than the original developer.
Tax payments	The amount of income taxes, if any, paid by the investor as a result of taxable income generated by a particular investment.
Tax savings	The income tax savings, if any, resulting from tax shelters provided by a particular property.
Useful life	The number of years over which the asset value will be depreciated.
Very low-income family	A family with income not exceeding 50 percent of the median income for the local area.

APPENDIX I

BRIEFING DOCUMENT ON MULTIFAMILY RENTAL HOUSING PRODUCTION INCENTIVES

PREPARED AT THE REQUEST OF THE CHAIRMAN, SUBCOMMITTEE ON HOUSING AND COMMUNITY DEVELOPMENT, HOUSE COMMITTEE ON BANKING, FINANCE AND URBAN AFFAIRS

APPENDIX I

GAO REVIEWED A NUMBER OF MULTIFAMILY RENTAL HOUSING PRODUCTION INCENTIVES

- FEDERAL TAX INCENTIVES
  - PROPERTY RECOVERY PERIOD REDUCED
- FEDERAL MORTGAGE INSURANCE
  - REDUCED EQUITY REQUIREMENTS
- DIRECT FINANCING SUBSIDIES
  - REDUCED MORTGAGE FINANCING COSTS
- RENTAL ASSISTANCE
  - SUBSIDIZES LOWER-INCOME RENTERS

GAO reviewed a number of multifamily rental housing production incentives

Over the years, the federal government has provided a variety of tax incentives, mortgage insurance, and subsidy programs to encourage private sector investment in rental housing, particularly for low-income families.

Federal tax incentives--property recovery period reduced

Under the tax laws in effect prior to the Economic Recovery Tax Act of 1981 (pre-ERTA), investors were allowed to choose one of a number of methods for depreciating project cost. The methods included (1) 200-percent declining balance, (2) sum-of-the-years digits, (3) straight line, and (4) component. Projects were allowed to be depreciated over 28 to 33 years depending on their useful tax lives. For rental projects, 33 years was generally accepted as an allowable tax life/recovery period. This period is shorter than a project's economic useful life which is estimated to be 60 to 70 years. Considering the shorter time in which to depreciate the property and the depreciation methods available, investors could write-off against their income, larger amounts of project costs earlier in the project's life.

The Economic Recovery Tax Act of 1981 (ERTA) reduced the tax life/recovery period to 15 years for projects produced on or after January 1, 1981. For conventional projects, the 200-percent declining balance method was changed to 175-percent declining balance. The more liberal 200-percent declining balance method was to be used exclusively for low-income projects. While the act made other changes affecting rental projects, the 15-year tax recovery period was the major change in terms of helping investors to shelter their income from taxes.

The Deficit Reduction Act of 1984, however, reduced the tax shelter benefits to investors in conventional projects produced after March 15, 1984, by increasing the tax life/recovery period to 18 years. The 1984 act did not change the tax life/recovery period for new low-income projects.

The tax benefits for low-income rental housing are also larger than those for conventional rental housing because investors in low-income projects can expense constructon period interest and property taxes when incurred. In contrast, investors in conventional projects must capitalize these expenses and amortize them over a 10-year period.

Federal mortgage insurance--
reduces equity requirements

Federal mortgage insurance protects lenders against losses by shifting the risk of borrower default to the federal government. In turn, this insurance induces lenders to finance projects and/or loan a larger percentage of project development cost for longer terms than otherwise would have been possible without the insurance. Because a larger percentage of development cost is financed, the investors' initial equity investment is reduced. This financial leverage provides investors with an opportunity to earn a higher rate of return because of their lower equity investment. To the extent that investment in low-income projects is more risky than investments in the otherwise equivalent units, a higher rate of return may be warranted. The Department of Housing and Urban Development (HUD) is the principal provider of federal mortgage insurance. HUD's section 221(d)(3) and (4) programs are the primary programs used today to insure new multifamily housing for lower income families.

The underwriting standards for several federal mortgage insurance programs allow loans as high as 90 percent of project development cost. We used this maximum in our model simulations. For conventionally financed projects, we used a loan amount equal to 75 percent of development cost, which we believe was representative of conventionally financed projects. While investors may be able to obtain private mortgage insurance, thereby allowing financial leverage similar to that obtained through federal mortgage insurance, we did not examine the degree to which this may occur. The estimated effects of financial leverage brought about by federal mortgage insurance is sensitive to our assumed after-tax rate of return to equity. The higher our assumed after-tax return (i.e., 15 percent), the greater the potential increase in investor profitability or reductions in rents. Our estimates for direct financing subsidies are similarly affected.

Rents for these HUD-insured projects are designed to be competitive with private rental projects. Prior to June 1983, HUD approved the allowable rents for insured projects with the objective of not exceeding rents for comparable projects in the same market area. The allowable rents consider the rental income necessary to maintain the economic soundness of the project and to provide reasonable rents to tenants. Since June 1983, however, rents in some HUD programs, such as section 221(d)(4) unsubsidized projects, have been decontrolled. Owners of these projects can amend their regulatory agreements, deleting the requirement that HUD approve rents, charges, and fees provided owners agree to limit their allowable cash distributions from project operations.

Direct financing subsidies--
reduced mortgage financing costs

Direct financing subsidies reduce mortgage financing costs. In federal housing programs these subsidies have consisted of (1) direct federal loans at reduced interest rates, such as in HUD's section 202 elderly housing program, and (2) interest rate reductions on HUD-insured loans. The latter was used in HUD's section 221(d)(3) and section 236, below-market interest rate programs. Tax-exempt industrial development bonds are currently a primary means for financing the construction of subsidized multifamily rental housing. Such bond financing can include, in addition to tax and financial leverage benefits, a direct loan at reduced interest rates. Other direct financing subsidy alternatives that could deliver results equivalent to those achieved through interest rate reduction subsidies include:

--Mortgage loan principal reduction provided by a one-time, up-front payment to the lender.

--Capital grant or investment tax credit. A capital grant involves a one-time, up-front payment to the developer/investor to reduce equity investment. Investment tax credits work the same as the grants but are provided through the tax system.

Rental assistance--
subsidizes lower income renters

Rental assistance provides direct monthly cash payments to owners of rental housing to cover the difference between project rent and the rents affordable by low- or very low-income families. This subsidy mechanism is used to provide rental housing in HUD's section 8 rental housing assistance program.

APPENDIX I

GAO USED A MODEL TO MEASURE THE EFFECTS OF PRODUCTION INCENTIVES ON

- **THE RENT LEVEL NEEDED TO COVER ALL COSTS, GIVEN AN ASSUMED AFTER-TAX RATE OF RETURN TO INVESTORS.**

OR

- **THE AFTER-TAX RATE OF RETURN TO INVESTORS, GIVEN AN ASSUMED RENT LEVEL.**

A model was used to measure the effects of production incentives on rents and after-tax rates of return

No current national figures are readily available on market rent levels or the after-tax rate of return necessary to induce development of new rental housing. Consequently, to measure the effects of production incentives on rents and investor rates of return, we used a discounted cash flow model developed by Dr. William B. Brueggeman, Corrigan Professor of Real Estate, Southern Methodist University. The model incorporates salient features for each production incentive based on historical data and other assumptions. Given an assumed after-tax rate of return, the model allows us to estimate the rent levels necessary to cover all costs of production, operation, and syndication over the holding period of the property. Similarly, assuming a market rate rent level, the model can be used to estimate the investors' nominal after-tax rates of return. Appendix II contains a technical description of the model and the assumptions used and a summary of the model outputs.

The model results estimate the potential effect of each production incentive on the relationship between rent levels and investor returns. The model does not explicitly review the extent to which there will be changes in the supply or demand for rental housing or the distribution of the rental housing stock between lower income units and conventional units. Since declining rents would affect both conventional and low-income units, further analysis would be essential to estimate the cost effectiveness of the production incentives.

The model was used to measure how

--ERTA has affected investor rates of return compared to pre-ERTA (see p. 8),

--ERTA's low-income tax treatment affects investor rates of return compared to ERTA's conventional tax treatment (see p. 10),

--the financial leverage benefits provided by federal mortgage insurance affect rates of return when used in conjunction with ERTA, (see p. 12), and

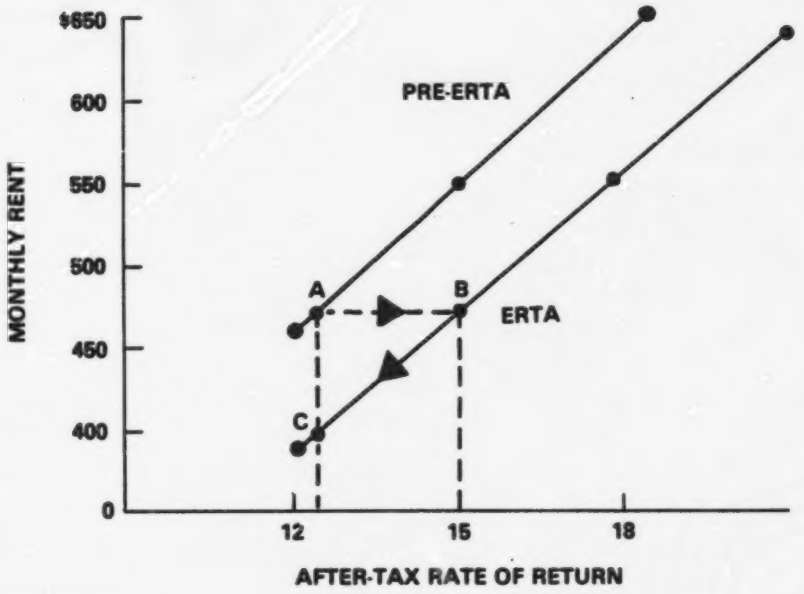
--direct financing subsidies together with financial leverage benefits affect rates of return under ERTA (see p. 14).

The following relationships between market rents and after-tax rates of return for each production incentive are based on the market rent levels needed to earn an after-tax rate of return of 15 percent, using a 6-percent inflation rate for a unit with a development cost of $32,000.

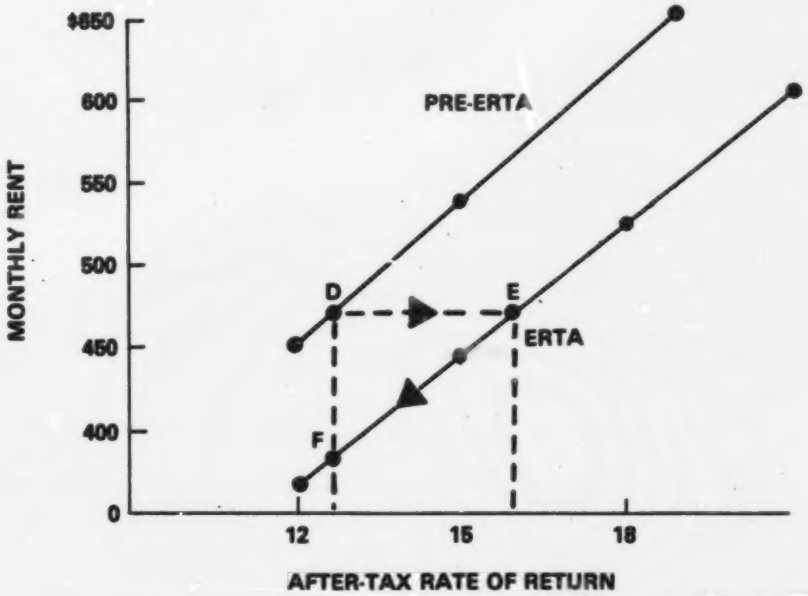
APPENDIX I

ERTA INCREASES INVESTOR RATES OF RETURN

- **COMPARISON OF PRE-ERTA AND ERTA CONVENTIONAL TAX TREATMENT**



- **COMPARISON OF PRE-ERTA AND ERTA LOW-INCOME TAX TREATMENTS**



ERTA increases investor rates of return

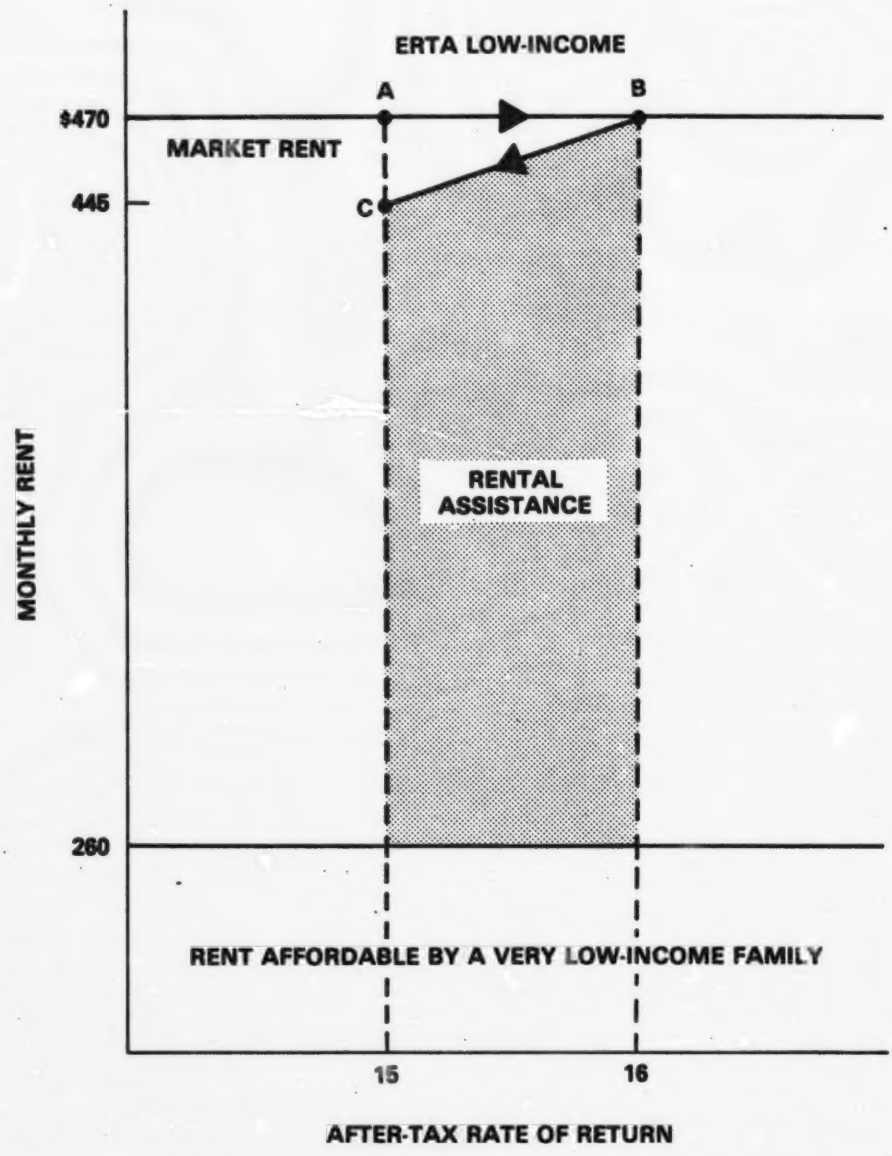
At the market rent level required to earn investors about a 12.5 percent after-tax rate of return under pre-ERTA conditions (points A and D), investor rates of return are increased to (1) 15 percent under the ERTA conventional tax treatment (point B) and (2) about 16 percent under the ERTA low-income tax treatment (point E).

To the extent the enhanced returns under ERTA stimulate production and increase competition, investors will tend to lower rents by accepting lower rates of return (see lines B to C and E to F), until rents and returns stabilize at competitive levels.

Our model results do not reflect the changes brought about by the Deficit Reduction Act of 1984. Specifically, the 1984 act increased the tax useful life under the ERTA conventional tax treatment, making investment in conventional rental housing somewhat less attractive. We compared the rents and returns under the ERTA conventional tax treatment, assuming the change to a 18-year tax life. Our results show that at the monthly market rent level assumed in our model ($470), the investor after-tax rate of return would decline from 15 percent to about 14 percent.

APPENDIX I

ERTA LOW-INCOME TAX TREATMENT SLIGHTLY ENHANCES RATES OF RETURN COMPARED TO ERTA CONVENTIONAL TAX TREATMENT



APPENDIX I

ERTA low-income tax treatment slightly enhances rates of return compared to ERTA conventional tax treatment

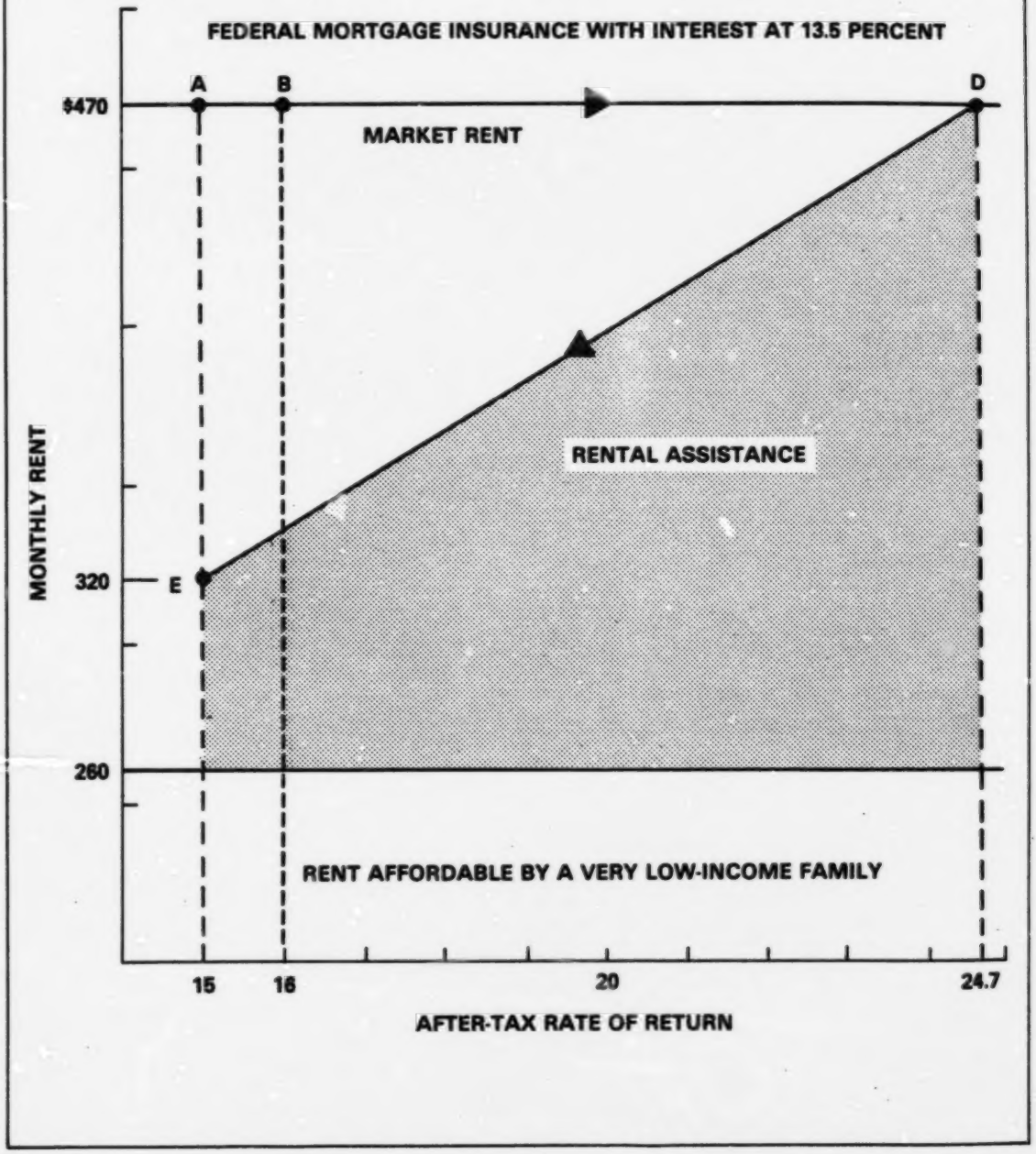
At the market rent level required to earn investors a 15-percent after-tax rate of return under the ERTA conventional tax treatment (point A), investor rates of return are increased to 16 percent (point B) by the ERTA low-income tax treatment.

Rents and returns will tend to decline along line B to C to the extent that competition forces investors to trade away their enhanced returns. This assumes that risks to the investor in developing conventional or low-income housing are comparable. To the extent there is a greater risk associated with low-income housing, the increased rates of return could be justified and rents should not be expected to decline.

To the extent that rents decline (line B to C), the rental assistance required to make units affordable by very low-income families would be reduced. For example, if investors were to compete away the entire ERTA low-income tax benefits, then monthly rents would decline from $470 to $445 and investors would earn a 15-percent return. Monthly rental assistance would likewise decline from $210 ($470-$260) to $185 ($445-$260).

APPENDIX I

FINANCIAL LEVERAGE BENEFITS FROM MORTGAGE INSURANCE INCREASE INVESTOR RATES OF RETURN AND/OR REDUCE RENTS



Financial leverage benefits from mortgage insurance increase investor rates of return or reduce rents

Our model assumes a loan amount equal to 90 percent of development cost with federal mortgage insurance and 75 percent of development cost with conventional financing. Our review of the estimated changes in rents and after-tax rates of return from federal mortgage insurance shows that:

--At the market rent level required to earn investors a 15-percent after-tax rate of return under the ERTA conventional tax treatment (point A), investor's rate of return is increased to 16 percent (point B) as a result of ERTA's low-income tax treatment as discussed on page 11. The additional incremental increase in the investor's rate of return to about 25 percent (point D) results from the financial leverage benefits provided by federal mortgage insurance.

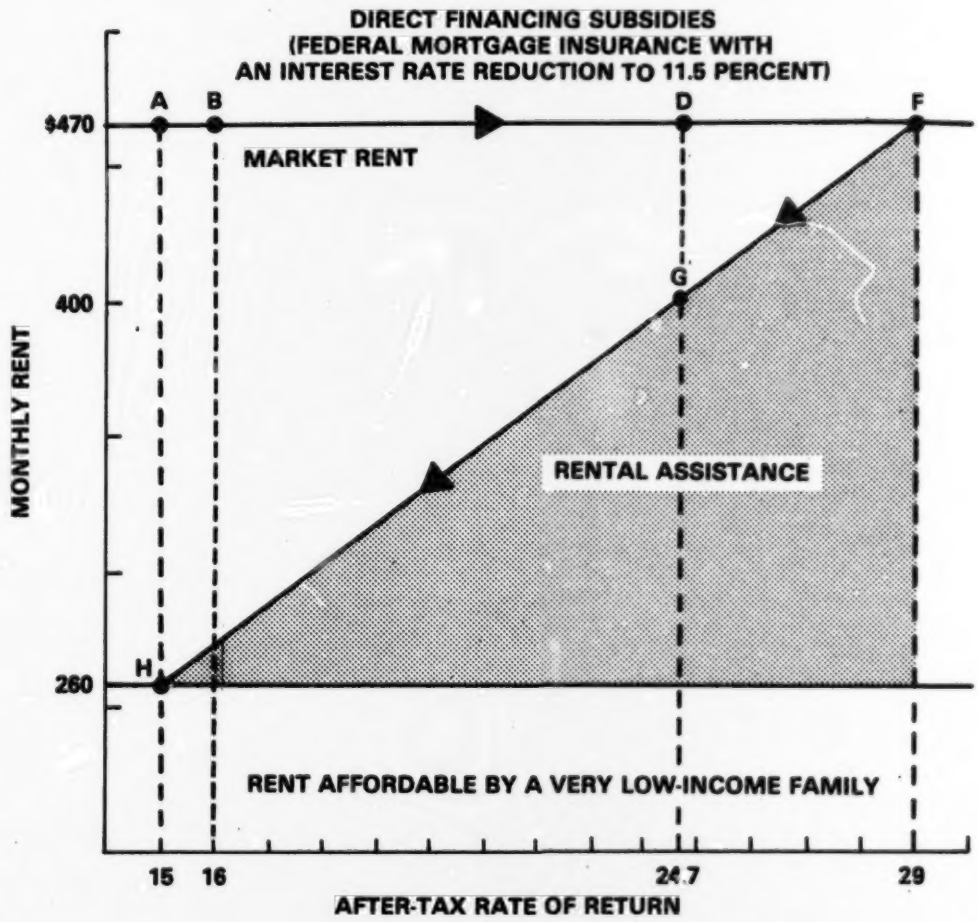
--Rents and returns will decline along line D to E to the extent that competition forces investors to trade away their enhanced returns and/or to the extent that rent controls are exercised.

--To the extent that rents decline (line D to E), the number of years of negative before-tax cash flows (that is, debt service and operating expenses exceed rental revenues) increase. Investors must finance these cash deficits through additional investor equity investments. These additional investor equity investments, however, are recovered through the annual tax saving benefits, which result in positive after-tax cash flows. (See cash flow schedules on pp. 24 and 25.)

--To the extent that rents decline (line D to E), the rental assistance required to make units affordable by very low-income families would be reduced. For example, if investors were to compete away the entire ERTA low-income tax and financial leverage benefits, then monthly rents would decline from $470 to $320 and investors would earn a 15 percent return. Monthly rental assistance would likewise decline from $210 ($470-$260) to $60 ($320-$260).

APPENDIX I

DIRECT FINANCING SUBSIDIES FURTHER INCREASE INVESTOR RATES OF RETURN AND/OR REDUCE RENTS



Direct financing subsidies further increase investor rates of return or reduce rents

Our model assumes a loan amount equal to 90 percent of development cost with federal mortgage insurance and 75 percent of development cost with conventional financing. Our review of the estimated changes in rents and after-tax rates of return from a federally insured mortgage loan with an interest rate reduction of 2 points, from 13.5 percent to 11.5 percent, shows that:

--At the market rent level required to give investors a 15-percent after-tax rate of return under the ERTA low-income tax treatment (point A), investor rates of return are increased to about 25 percent (point D) as a result of ERTA's low-income tax treatment and the financial leverage from mortgage insurance. The additional incremental increase in the investor's rate of return to 29 percent (point F) results from below market interest rate benefits from the financing subsidy.

--Rents and returns will decline along line F to G to the extent program controls require the below-market interest rate reduction benefits to be passed through to tenants.

--Rents and returns will decline along line G to H to the extent competition forces investors to trade away their enhanced returns and/or rent controls are exercised.

--To the extent that rents decline (line F to H), the rental assistance required to make units affordable by very low-income families is also reduced. For example, if investors were to compete away the entire ERTA low-income tax, financial leverage, and interest rate reduction benefits, then monthly rents would decline from $470 to $260, investors would earn a 15-percent return, and rental assistance would not be required.

Rent and after-tax rate of return results equivalent to a 2-point interest rate reduction can also be achieved by providing a

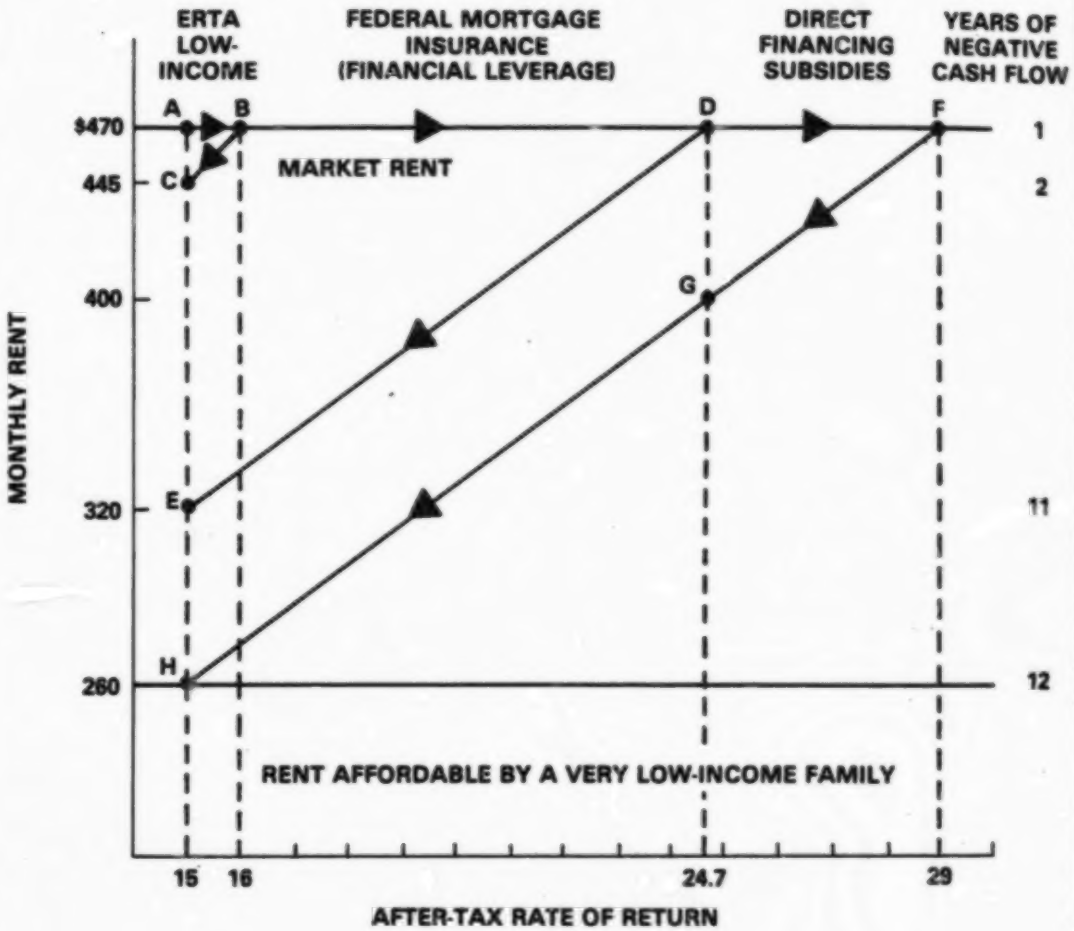
--mortgage principal buy-down subsidy of about 14 percent of the loan amount;

--capital grant or investment tax credit subsidy of about 5 percent of development costs; or

--direct loan for 90 percent of development cost at 11.5 percent interest for 40 years, financed directly by the federal government or through state and local government tax-exempt industrial development bond financing.

APPENDIX I

OVERALL PERSPECTIVE ON HOW RENTAL HOUSING PRODUCTION INCENTIVES CAN EITHER INCREASE INVESTOR PROFITABILITY AND/OR REDUCE RENTS



Overall perspective

Production incentives can either increase investor profitability and/or lower rents, thereby making rents more affordable by lower income families. Specifically, our model showed that:

--ERTA's low-income tax treatment, compared to ERTA's conventional tax treatment, provides only a slightly higher rate of return from 15 to 16 percent (point A to point B).

--Financial leverage benefits from federal mortgage insurance increase the rate of return from 16 percent to about 25 percent (point B to point D).

--Below-market interest rate benefits from direct financing subsidies further increase the rate of return from about 25 percent to 29 percent (point D to point F).

Our results measured the extent to which investor rates of return would increase, assuming market conditions allowed investors to charge rents necessary to give investors a 15-percent after-tax rate of return under ERTA's conventional tax treatment. Nationwide data were not available to determine whether our assumed rents and rate of return are reasonable. However, when we adjusted rents to yield investors after-tax rates of return of 12 or 18 percent, our model showed that the production incentives had a positive impact on investor profitability similar to the ones reported above.

The production incentives we reviewed tend to increase rates of return; therefore, these increases should attract more private investment in new rental housing. As the supply of rental housing expands, investors should have to compete away some of these increased returns by accepting lower rents until supply and demand are brought into balance. This period of adjustment generally takes several years to complete.

The extent that rents decline (see lines B to C, D to E, and F to H) will depend largely on the rate of return required to induce development of rental housing, the availability of production incentives to investors, the competitive nature of individual rental housing markets, and the degree of rent control the federal government exercises. As rents decline toward points C, E, or H, the number of years of negative before-tax cash flows increase for investors. As a result, investors must finance these cash deficits through additional equity investments. These additional investments are recovered through the annual tax savings benefits, which result in positive after-tax cash flows.

APPENDIX II

TECHNICAL DESCRIPTION OF MODEL AND SUMMARY OF MODEL OUTPUTS

- DISCOUNTED CASH FLOW MODEL FORMULA
- MODEL ASSUMPTIONS
- DISCOUNTED CASH FLOW SCHEDULES FOR THE FEDERAL MORTGAGE INSURANCE CASE
- SUMMARY OF MODEL OUTPUTS: RENT-TO-COST RATIO GIVEN AN AFTER-TAX RATE OF RETURN LEVEL
- SUMMARY OF MODEL OUTPUTS: AFTER-TAX RATE OF RETURN GIVEN A MARKET RENT LEVEL

APPENDIX II

Discounted cash flow model formula

The following model was used to estimate required after-tax returns on equity investment in this study. In this framework, cash outflows related to development costs (adjusted for tax considerations relevant to the development phase), after-tax cash flows from annual operating revenues less expenses, and after-tax cash flows from the sale of the property in some future year are discounted by a required after-tax rate of return until equality between inflows and outflows is achieved. More specifically, the nominal after-tax rate of return (K) on equity invested in a real estate income property investment can be determined from:

$$\sum_{i=1}^{d} \frac{(TDC_i - DF_i)}{(1+K)^i} = \sum_{i=1}^{s} \frac{(R_i - O_i - I_i - P_i) - (R_i - O_i - I_i - D_i - A_i)t_o}{(1+K)^i}$$

$$+ \frac{V_s - B_s - S_s - G_s t_g - RC_s t_o}{(1+K)^s}$$

where: TDC = total development costs (demand price), including land and partnership syndication costs,

DF = development financing,

d = end of development period,

s = holding period (years),

R_i = rental income in year i,

O_i = operating expenses, including property taxes, in year i,

I_i = interest on the mortgage paid in year i,

D_i = tax depreciation taken in year i,

A_i = amortization of construction interest and property taxes,

t_o = marginal ordinary income tax rate,

t_g = marginal capital gains tax rate,

P_i = principal portion (amortization) of the loan payment in year i,

V_S = estimated value and selling price in year s,

S_S = selling and other transactions costs in year s,

G_S = capital gain, net of selling costs (S_S), resulting from sale in year s,

RC_S = net excess depreciation (accelerated over straight line) which is recaptured upon sale (if relevant),

B_S = balance of mortgage in year s, and

K = nominal after-tax discount rate on equity investment in a property held for s years.

In the long run, the present value of after-tax cash flows, when set equal to the present value of equity invested in the property (total development costs, less development financing), would result in the marginal investor earning a competitive, after-tax rate of return (K) if the property is held for s years. Similarly, if the after-tax rate of return is given, the model can be modified and rents can be determined, given estimates of other variables.

Model assumptions

Development cost

Development cost for HUD-insured projects were based on the costs of constructing 114 HUD-insured section 221(d)(4) unsubsidized rental projects contained in a study of HUD multifamily housing programs.[1] Because data were not readily available on conventional projects, we used the average cost data for these section 221(d)(4) projects, exclusive of financing fees related to the HUD insurance, to estimate the development cost for conventional rental housing.

Financing

The financing assumptions used in our model reflect a loan equal to 75 percent of development cost for 25 years for conventional projects and 90 percent of development cost for 40 years for HUD-insured projects. For the initial construction period and mortgage term, we used a 14-percent interest rate for conventional

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[1]"The Costs of HUD Multifamily Housing Programs," Department of Housing and Urban Development (Washington, D.C.: May 1982).

loans and 13.5 percent, which includes a mortgage insurance premium of 0.5 percent, for HUD-insured loans. These rates generally reflected the average rates in effect during the period these 114 projects were built.

Syndication cost

Our model assumes that ownership interest in the project is syndicated (sold) to investors under a limited partnership arrangement at the start of construction. Usually, investors pay 20 to 30 percent of the mortgage loan amount to obtain a 95- to 99-percent interest in the project's operations and 40- to 60-percent of the project's residual value. Ownership interest may be sold to investors directly by the developer or through a syndicator or underwriter for a syndication fee, usually about 9 to 13 percent of the equity raised. Our model assumes that passive investors paid 20 percent of the mortgage loan amount to obtain a 95-percent interest in project operations and a 60-percent residual value. Our model also assumes a 12-percent syndication fee resulting in syndication cost equal to about 8 percent of the development cost. This syndication cost was added to development cost to estimate the project's total development cost.

Operating cost

Annual operating costs were assumed to be a constant proportion of rents, adjusted for normal vacancies of 5 percent. Vacancies in the first year of operations, however, are assumed to average 50 percent during the initial rent-up period. Operating cost were set at 35 percent of adjusted rents. Annual operating costs were based on the average operating costs reported for 995 section 221(d)(4) unsubsidized projects during 1981. The 35-percent ratio closely approximates nationwide income and operating cost data for unfurnished garden type buildings reported in 1982.[2]

Residual value

In estimating residual value, our model assumes that the project appreciates with inflation, adjusted for economic depreciation. Economic depreciation is a loss of property value through physical deterioration or functional or economic obsolescence. This economic depreciation is based on a straight-line rate over an expected life of 70 years. Selling and other transaction

[2]"Income and Expense Analysis of Apartments, 1982," Institute of Real Estate Management, National Association of Realtors (Chicago 1982), pp. 131-200.

costs, which were estimated to be 6 percent of the estimated sales price, were also deducted to arrive at the project's net residual value.

Tax treatment

The federal income tax variables used in our model represent the pre-ERTA and ERTA tax treatments applicable to the marginal investor. Under pre-ERTA, a useful tax life of 30 years was selected based on a composite tax life of 33 years adjusted for the probable use of component depreciation by investors. We used the 200-percent declining balance method for depreciation, switching to the straight-line depreciation method in the later years, based on the assumption that this method provides investors with the most rapid write-off allowable.

Under ERTA, our model used the 175-percent declining balance method of depreciation for conventional projects and 200-percent declining balance for low-income projects. We switched to the straight-line method in the later years to maximize the investors recovery allowance. We assumed the projects would be held for their useful tax life, or 15 years. Because our pre-ERTA approach assumed a 30-year useful tax life and the same 15-year holding period, our model assumes that excess depreciation is recaptured under the pre-ERTA approach.

The marginal tax rates for investors under both approaches were assumed to be 50 percent for ordinary income and 20 percent for capital gains. ERTA reduced the top marginal tax rate from 70 percent to 50 percent and reduced the maximum tax rate on long-term net capital gains from 28 percent to 20 percent.

Investor after-tax rates of return

The model uses after-tax rates of return of 12, 15, and 18 percent. We assumed that as a minimum the after tax-rate of return on investor equity, including syndication costs, should equal the after-tax yield on the prevailing mortgage interest rates (7 percent for conventional projects and 6.75 percent for HUD-insured projects). We added a risk premium of about 5 percent, 8 percent, and 11 percent to arrive at the after-tax discount rates of 12, 15, and 18 percent, respectively. However, adequate data were not available for us to determine whether these risk premiums are justified or whether these after-tax rates of return reflect what investors actually earn.

Market rate rents

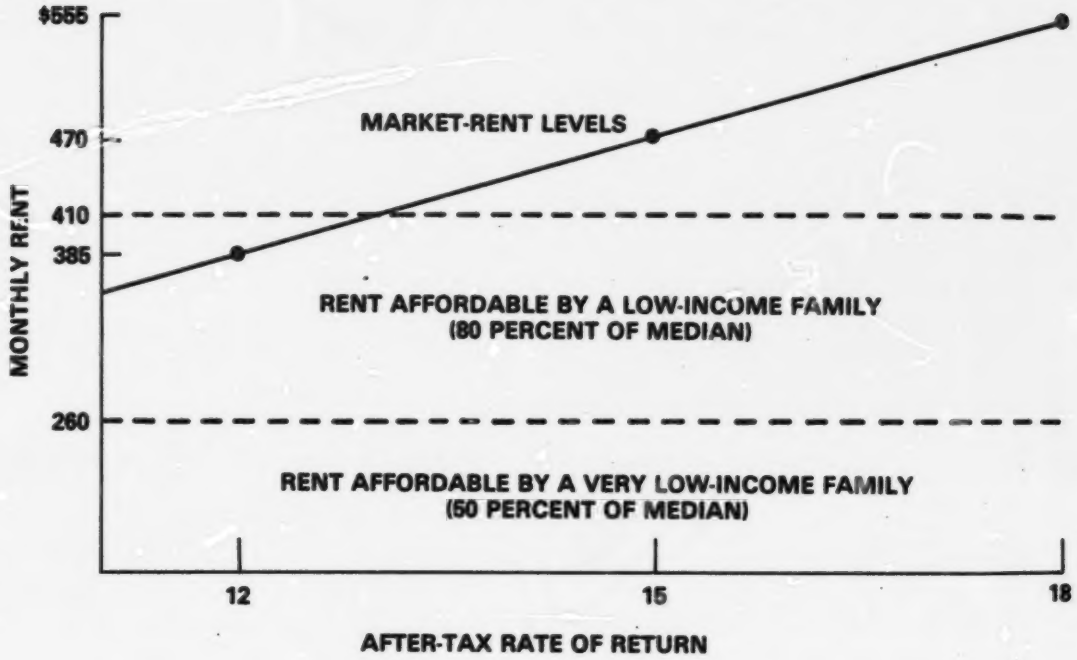
We also used our model to estimate the rent level necessary to provide after-tax rates of return of 12, 15, and 18 percent based on the ERTA conventional tax treatment for a privately

owned, unsubsidized rental unit. The graph below shows these results for a unit with a development cost of $32,000.

Rents affordable by lower income families

In applying our model, we considered the monthly rent affordable by lower income families. We assumed these families could afford rents equal to 30 percent of their incomes. HUD often uses the figure of 30 percent or less of gross income as a benchmark for a reasonable or affordable rent burden for a lower income family. Incomes for low- and very low-income families were based on 80- and 50-percent, respectively, of the 1981 median annual income of $20,603 for all households inside standard metropolitan statistical areas. This information was included to show the rental assistance and/or direct financing subsidies that would be required to target rents to these families. The graph below shows the rent levels affordable by low- and very low-income families.

MARKET RENTS AND RENTS AFFORDABLE BY LOWER INCOME FAMILIES



Discounted Cash Flow Schedule: Mortgage Insurance
Assuming Interest at 13.5 Percent--At Market Rent
Levels With 3 Years Negative Before-Tax Cash Flow
Investors Earn A 25 Percent After-Tax Rate Of Return
(Figures Expressed As A Percentage Of Development Costs)

Year	0	1	2	3	4	5	6	7
					(percent)			
Gross income		17.56	18.61	19.73	20.91	22.01	23.17	24.38
Vacancy		-09.31	-01.30	-01.38	-01.46	-01.54	-01.62	-01.71
Effective gross income		08.25	17.31	18.35	19.45	20.47	21.55	22.67
Operating expenses		-02.89	-06.06	-06.42	-06.81	-07.16	-07.54	-07.94
Net operating income		05.36	11.25	11.93	12.64	13.31	14.01	14.73
Debt service		-12.21	-12.21	-12.21	-12.21	-12.21	-12.21	-12.21
Before-tax cash flow		-06.85	-00.96	-00.28	00.43	01.10	01.80	02.52
Net operating income		05.36	11.25	11.93	12.64	13.31	14.01	14.73
Interest expense		-12.15	-12.14	-12.13	-12.12	-12.10	-12.09	-12.07
Depreciation expense		-11.31	-09.86	-08.61	-07.52	-06.58	-05.47	-04.76
Amortized expense		-02.50	- 0.00	- 0.00	- 0.00	- 0.00	- 0.00	- 0.00
Earnings before tax		-20.60	-10.75	-08.81	-07.00	-05.37	-03.55	-02.10
Marginal tax rate		.50	.50	.50	.50	.50	.50	.50
Federal tax saving (payment)		10.30	05.38	04.41	03.50	02.69	01.78	01.05
Before-tax cash flow		-06.85	-00.96	-00.28	00.43	01.10	01.80	02.52
Federal tax saving (payment)		10.30	05.38	04.41	03.50	02.69	01.78	01.05
After-tax cash flow:								
Operations		03.45	04.42	04.13	03.93	03.79	03.58	03.57
Residual		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net after-tax cash flow	-17.15	03.45	04.42	04.13	03.93	03.79	03.58	03.57

Year	8	9	10	11	12	13	14	15
					(percent)			
Gross income	25.66	27.01	28.23	29.50	30.82	32.21	33.66	35.17
Vacancy	-01.80	-01.89	-01.98	-02.06	-02.16	-02.25	-02.36	-02.46
Effective gross income	23.86	25.12	26.25	27.44	28.66	29.96	31.30	32.71
Operating expenses	-08.35	-08.79	-09.19	-09.60	-10.03	-10.48	-10.96	-11.45
Net operating income	15.51	16.33	17.06	17.84	18.63	19.48	20.34	21.26
Debt service	-12.21	-12.21	-12.21	-12.21	-12.21	-12.21	-12.21	-12.21
Before-tax cash flow	03.30	04.12	04.85	05.63	06.42	07.27	08.13	09.05
Net operating income	15.51	16.33	17.06	17.84	18.63	19.48	20.34	21.26
Interest expense	-12.05	-12.03	-12.00	-11.98	-11.94	-11.90	-11.86	-11.81
Depreciation expense	-04.15	-03.86	-03.86	-03.86	-03.86	-03.86	-03.86	-03.86
Amortized expense	- 0.00	- 0.00	- 0.00	- 0.00	- 0.00	- 0.00	- 0.00	- 0.00
Earnings before tax	-00.69	-00.44	-01.20	-02.00	-02.83	-03.72	-04.62	-05.59
Marginal tax rate	.50	.50	.50	.50	.50	.50	.50	.50
Federal tax saving (payment)	00.35	-00.22	-00.60	-01.00	-01.42	-01.86	-02.31	-02.80
Before-tax cash flow	03.30	04.12	04.85	05.63	06.42	07.27	08.13	09.05
Federal tax saving (payment)	00.35	-00.22	-00.60	-01.00	-01.42	-01.86	-02.31	-02.80
After-tax cash flow:								
Operations	03.65	03.90	04.25	04.63	05.00	05.41	05.82	06.25
Residual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.85
Net after-tax cash flow	03.65	03.90	04.25	04.63	05.00	05.41	05.82	50.10

APPENDIX II

Discounted Cash Flow Schedule: Mortgage Insurance
Assuming Interest at 13.5 Percent--At Below-Market
Rent Levels With 11 Years Negative Before-Tax Cash
Flow Investors Earn A 15 Percent After-Tax Rate Of Return
(Figures Expressed As A Percentage Of Development Costs)

Year	0	1	2	3	4	5	6	7
					(percent)			
Gross income		12.00	12.72	13.48	14.29	15.04	15.83	16.66
Vacancy		-06.36	-00.89	-00.94	-01.00	-01.05	-01.11	-01.17
Effective gross income		05.64	11.83	12.54	13.29	13.99	14.72	15.49
Operating expenses		-01.97	-04.14	-04.39	-04.65	-04.90	-05.15	-05.42
Net operating income		03.67	07.69	08.15	08.64	09.09	09.57	10.07
Debt service		-12.21	-12.21	-12.21	-12.21	-12.21	-12.21	-12.21
Before-tax cash flow		-08.54	-04.52	-04.06	-03.57	-03.12	-02.64	-02.14
Net operating income		03.67	07.69	08.15	08.64	09.09	09.57	10.07
Interest expense		-12.15	-12.14	-12.13	-12.12	-12.10	-12.09	-12.07
Depreciation expense		-11.31	-09.86	-08.61	-07.52	-06.58	-05.47	-04.76
Amortized expense		-02.50	- 0.00	- 0.00	- 0.00	- 0.00	- 0.00	- 0.00
Earnings before tax		-22.29	-14.31	-12.59	-11.00	-09.59	-07.99	-06.76
Marginal tax rate		.50	.50	.50	.50	.50	.50	.50
Federal tax saving (payment)		11.15	07.16	06.30	05.50	04.80	04.00	03.38
Before-tax cash flow		-08.54	-04.52	-04.06	-03.57	-03.12	-02.64	-02.14
Federal tax saving (payment)		11.15	07.16	06.30	05.50	04.80	04.00	03.38
After-tax cash flow:								
Operations		02.61	02.64	02.24	01.93	01.68	01.36	01.24
Residual		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net after-tax cash flow	-17.15	02.61	02.64	02.24	01.93	01.68	01.36	01.24

Year	8	9	10	11	12	13	14	15
					(percent)			
Gross income	17.54	18.46	19.29	20.16	21.06	22.01	23.00	24.04
Vacancy	-01.23	-01.29	-01.35	-01.41	-01.47	-01.54	-01.61	-01.68
Effective gross income	16.31	17.17	17.94	18.75	19.59	20.47	21.39	22.36
Operating expenses	-05.71	-06.01	-06.28	-06.56	-06.86	-07.16	-07.49	-07.82
Net operating income	10.60	11.16	11.66	12.19	12.73	13.31	13.90	14.54
Debt service	-12.21	-12.21	-12.21	-12.21	-12.21	-12.21	-12.21	-12.21
Before-tax cash flow	-01.61	-01.05	-00.55	-00.02	00.52	01.10	01.69	02.33
Net operating income	10.60	11.16	11.66	12.19	12.73	13.31	13.90	14.54
Interest expense	-12.05	-12.03	-12.00	-11.98	-11.94	-11.90	-11.86	-11.81
Depreciation expense	-04.15	-03.86	-03.86	-03.86	-03.86	-03.86	-03.86	-03.86
Amortized expense	- 0.00	- 0.00	- 0.00	- 0.00	- 0.00	- 0.00	- 0.00	- 0.00
Earnings before tax	-05.60	-04.73	-04.20	-03.65	-03.07	-02.45	-01.82	-01.13
Marginal tax rate	.50	.50	.50	.50	.50	.50	.50	.50
Federal tax saving (payment)	02.80	02.37	02.10	01.83	01.54	01.23	00.91	00.57
Before-tax cash flow	-01.61	-01.05	-00.55	-00.02	00.52	01.10	01.69	02.33
Federal tax saving (payment)	02.80	02.37	02.10	01.83	01.54	01.23	00.91	00.57
After-tax cash flow:								
Operations	01.19	01.32	01.55	01.81	02.06	02.33	02.60	02.90
Residual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.85
Net after-tax cash flow	01.19	01.32	01.55	01.81	02.06	02.33	02.60	46.75

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Summary Of Model Outputs: Initial Rent as a Percentage of Development Cost[a] Given Required After-Tax Rate of Return

	Percent					
Inflation rate	4			6		
After-tax rate of return	12	15	18	12	15	18
CONVENTIONAL RENTAL HOUSING[b]						
Pre-ERTA tax treatment:						
Conventional[c]	21.1	24.4	27.7	17.2	20.6	24.1
Low-income[d]	20.8	23.9	27.2	16.9	20.2	23.5
ERTA tax treatment:						
Conventional[e]	18.0	21.0	24.2	14.4	17.6	20.8
Low-income[f]	17.2	20.0	22.9	13.7	16.7	19.7
FEDERALLY INSURED RENTAL HOUSING[g]						
(ERTA low-income tax treatment[f])						
Mortgage interest (percent) rate						
13.5	13.4	14.8	16.3	10.3	12.0	13.7
12.5	12.1	13.5	15.0	9.2	10.8	12.5
11.5	10.8	12.2	13.7	8.0	9.7	11.3
10.5	9.7	11.0	12.4	6.9	8.5	10.2
9.5	8.4	9.8	11.2	5.8	7.4	9.0
8.5	7.3	8.6	10.0	4.7	6.3	7.9

[a]Includes land and development costs, but excludes syndication cost.

[b]Assumes conventionally financed mortgage loan at 75 percent of total development costs, with mortgage interest rate of 14 percent for 25 years.

[c]Pre-ERTA tax treatment for new conventional rental housing assumes a 200-percent declining balance depreciation method, a 30-year depreciable life, and a 10-year write-off of construction period interest and taxes.

[d]Pre-ERTA tax treatment for new low-income rental housing assumes a 200-percent declining balance depreciation method, a 30-year depreciable life, and a 1-year write-off of construction period interest and taxes.

[e]ERTA tax treatment for new conventional rental housing assumes a 175-percent declining balance depreciation method, a 15-year depreciable life, and a 10-year write-off of construction period interest and taxes. Represents market rent levels.

[f]ERTA tax treatment for new low-income rental housing assumes a 200-percent declining balance depreciation method, a 15-year depreciable life, and a 1-year write-off of construction period interest and taxes.

[g]Assumes federally insured mortgage loan at 90 percent of total development costs for 40 years. Analysis is shown for various mortgage interest rates.

APPENDIX II

Summary of Model Outputs: After-Tax Internal Rate of Return[a] Given a Market Rent Level

Inflation rate	Percent					
	4			6		
After-tax rate of return	12	15	18	12	15	18
Market rent	18.0	21.0	24.2	14.4	17.6	20.8
CONVENTIONAL RENTAL HOUSING[b]						
Pre-ERTA tax treatment:						
Conventional[c]	9.1	12.0	14.9	9.5	12.4	15.2
Low-income[d]	9.3	12.3	15.3	9.7	12.7	15.6
ERTA tax treatment:						
Conventional[e]	12.0	15.0	18.0	12.0	15.0	18.0
Low-income[f]	12.9	16.1	19.3	12.7	15.9	19.1
FEDERALLY-INSURED RENTAL HOUSING[g]						
(ERTA low-income tax treatment[f])						
Mortgage interest (percent) rate						
13.5	21.3	26.9	32.4	19.2	24.7	30.2
12.5	23.8	29.4	34.8	21.3	26.8	32.4
11.5	26.4	31.8	37.2	23.5	29.0	34.5
10.5	28.8	34.2	39.5	25.6	31.2	36.7
9.5	31.1	36.5	41.7	27.7	33.3	38.8
8.5	33.4	38.7	43.9	29.8	35.3	40.8

[a]The after-tax internal rate of return the limited partner-investor would earn based on market rent levels established for the discount rates under the two inflation rates.

[b]Assumes conventionally financed mortgage loan at 75 percent of total development costs, with mortgage interest rate of 14 percent for 25 years.

[c]Pre-ERTA tax treatment for new conventional rental housing assumes a 200-percent declining balance depreciation method, a 30-year depreciable life, and a 10-year write-off of construction period interest and taxes.

[d]Pre-ERTA tax treatment for new low-income rental housing assumes a 200-percent declining balance depreciation method, a 30-year depreciable life, and a 1-year write-off of construction period interest and taxes.

[e]ERTA tax treatment for new conventional rental housing assumes a 175-percent declining balance depreciation method, a 15-year depreciable life, and a 10-year write-off of construction period interest and taxes.

[f]ERTA tax treatment for new low-income rental housing assumes a 200-percent declining balance depreciation method, a 15-year depreciable life, and a 1-year write-off of construction period interest and taxes.

[g]Assumes federally insured mortgage loan at 90 percent of total development costs for 40 years. Analysis is shown for various mortgage interest rates.

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